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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,940	04/13/2004	Joseph F. Bringley	87428SMR	4455

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ART UNIT	**PAPER NUMBER**
1773	

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.

EXAMINER

10/822,940

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20061027

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Commissioner for Patents

The previous Examiner's Answer mailed October 2, 2006 was deficient because the references relied upon in the Examiner's Answer were omitted in section (8) "Evidence Relied Upon". The enclosed Examiner's Answer supercedes the previously mailed Examiner's Answer. Any questions should be directed to Examiner Le at 571-272-1511.

H. T. Le
Primary Examiner
Art Unit: 1773

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/822,940
Filing Date: April 13, 2004
Appellant(s): BRINGLEY, JOSEPH F.

Andrew Anderson
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 12, 2006 appealing from the Office action mailed April 5, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct. However, the examiner has maintained only the obviousness rejection to claims 1-44 under 35 USC 103(a) based on the combination of DeVoe patent (US 4,530,963) and Ranney patent (US 6,106,866).

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection of claims 1-3, 6-10 and 15-21 under 35 USC 103 (b) based on the Ranney patent (US 6,106,866).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,530,963	**DeVoe**	**7-1985**
6106866	**Ranney**	**8-2000**

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-44 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the DeVoe patent (US 4,530,963) in combination with the Ranney patent (US 6,106,866). Details of the rejection, which have been presented in previous office actions, are reiterated as follows:

Claim 1: The Ranney patent teaches an in vivo agent comprising a nanoparticle base (drug carrier) and a metal ion sequestrant (metal chelator) on the surface of the nanoparticle. See Ranney, col. 2, lines 26-29 and 37-41; and col. 15, line 66 to col. 16, line 1.. The nanoparticle may have a size of less than 250 nm. See Ranney, col. 15, lines 49-57 and col. 19, lines 55-57. Ranney patent does not specify the materials for the nanoparticle and gives limited teaching regarding the materials suitable as the chelating agent. However, Ranney does state that hydrophobic (i.e. insoluble) carriers are equally "favored" as hydrophilic carriers. See

Ranney, col. 3, lines 2-4; and col. 18, lines 17-22. Similar to the Ranney patent, the DeVoe patent also teaches a composition comprising a carrier and a chelator on the surface of the carrier. See DeVoe, col. 2, lines 25-35. Better than Ranney, the DeVoe patent gives specific details as to the materials for the carrier and the metal ion chelators. The DeVoe further teaches the carrier being an inorganic hydrophobic material (DeVoe, col. 12, lines 64-65); and specific materials as chelators that function well over a wide assortment of heavy metal ions (DeVoe, col. 2, lines 33-35 and col. 5, lines 17-21).

In other words, Ranney applies the new nanotechnology by employing a nanoparticle as the carrier, and the DeVoe supplies specific information in selecting the components that would serve the purposes sought by Ranney, which is metal ion sequestration. Therefore, one having ordinary skill in the art would have found it obvious to combine the teachings of Ranney and DeVoe in order to obtain a composition comprising a nanostructured carrier and metal-ion chelators that provide high stability for heavy metals, in particular iron(III). The outcome of this combination would be the best possible results in metal ion sequestration.

With regard to the stability constant of the nanoparticle, both Ranney and DeVoe focus on chelating iron (III). See Ranney, col. 19, lines 55-56 and 61-62; and DeVoe, col. 2, lines 25-30. Therefore, it would have been obvious to one of ordinary skill in the art to select chelating agents that provides optimal stability constant with iron (III), which is a stability constant of greater than 10^{10} as claimed.

Claims 2-3: See Ranney, col. 15, lines 56-57.

Claims 4-5: See DeVoe, col. 12, lines 64-65 and col. 14, lines 43-44.

Claims 6-8: The hedroxamate, deferoxamine, and specific amine derivatives taught by Ranney (Ranney, col. 19, lines 56-57 and col. 20, lines 13-16) and the chelators taught by DeVoe (DeVoe, col. 2, lines 60 to col. 3, line 21) intrinsically possess a stability constant with iron (III) of greater than 10^{30} , and thus inherently high stability constant for copper, zinc, aluminum and other heavy metals.

Claim 9: See Ranney, col. 20, lines 12-13 (polyaminocarboxylate inherently contains alpha amino carboxylate functional group); and DeVoe, col. 2, lines 60-66.

Claim 10: See Ranney, col. 19, lines 55-56; and DeVoe, col. 3, lines 10-21.

Claims 11-13: See DeVoe, col. 13, line 18 to col. 14, line 39.

Claim 14: See DeVoe, col. 2, lines 60 to col. 3, line 21.

Claims 15-18: Ranney teaches nanoparticle with particle size of less than 250nm or even 25 nm (col. 15, lines 55-57). A particle size of less than 250 nm corresponds to a specific surface area of greater than 200 m^2/g.

Claim 19: See DeVoe, col. 14, lines 18-24.

Claims 20-21: See Ranney, col. 15, lines 56-57.

Claims 22-44: The Ranney patent teaches the application of the composition discussed above. See Ranney, col. 15, lines 7-48.

(10) Response to Argument

1. Applicant argued that "the compositions of Ranney are directed towards drug delivery systems and medical imaging enhancement" while the nanoparticles of the present

invention are "able to target and remove specific metal-ions from a solution, while leaving intact the concentrations of beneficial metal-ions...,... can be utilized in numerous items and articles without significantly changing their color or appearance, and ... are easy to apply." This argument is simply a statement of the advantages of Applicant's invention, but it is neither relevant nor ancillary to the issues at hand because none of the elements mentioned in this argument are present in the rejected claims.

2. Applicants argued that the combination of the Ranney and DeVoe patents are improper because "the compositions and technology described in Ranney and DeVoe are very different from each other." Contrary to Applicant's argument, the common concept between the Ranney and DeVoe patents is a product comprising a metal-ion chelating agent, especially iron chelator, on a carrier. In addition, the products of both patents are stated to be suitable for bioapplication: In Ranney, the application is in drugs for human bodies (See Ranney, throughout the specification) and in DeVoe it's for biological systems (see DeVoe, col. 1, lines 13-30). The teaching of Ranney provides DeVoe with carrier of nanoscale while the teaching of DeVoe supplements Ranney with various highly effective metal chelators, especially iron chelators. Therefore, motivation of combining these two patents exists.

3. Applicant further argued that "it would accordingly not be obvious to the artisan to substitute the <u>insoluble</u> inorganic carriers of DeVoe et al for the specified <u>hydrophilic organic carriers</u> of Ranney". As stated in section (9) ("Grounds of Rejection) above, Ranney states that "hydrophobic" (i.e. insoluble) carriers are equally favored as hydrophilic carriers. See Ranney, col. 3, lines 2-4; and col. 18, lines 17-22. Therefore, it would have

been obvious to substitute the carriers of DeVoe with the more efficient nanoscale carriers of Ranney.

4. Applicant argued that the "organic materials of Ranney need to be small in size to be nonembolizing, for example, to avoid obstructing a blood vessel when used in a live human being." Thus, Applicant concluded that these aspects "are not useful" when applied to DeVoe. As stated in section (9) above, the usefulness of combining these two teachings are to provide a possibility of using DeVoe product in nanoscale and to provide Ranney additional options in selecting materials suitable for Ranney's purpose. In other words, Ranney's teaching benefits DeVoe's in terms of expanding the structure of DeVoe's product to nano-dimensions, while DeVoe's teaching benefits Ranney's in terms of widening the selections of materials for Ranney's purposes.

5. With respect to claims 3, 17-18, 26, 40 and 41, Applicant argued that though Ranney suggests nanoparticles having a size of 25 nm or less, Ranney "does not disclose or suggest the use of inorganic nanoparticles having a preferred size of 20 nm or less." Ranney's teaching of nanoparticles having a size of 25 nm would logically encompass inorganic nanoparticles having a size of 20 nm because this 5 nm range is narrow enough to expect no difference in the nanoparticles. In addition, it is known in the art that the smaller the particle size, the higher the surface area. Therefore, one ordinary skill in the art would have been motivated to select nanoparticles as small as possible in order to increase the surface area of the particles and thus increase the metal chelating effect of the particles.

6. With regard to claims 4, 5, 27 and 28, Applicant argued that neither DeVoe nor Ranney disclose or suggest use of inorganic nanoparticles having the claimed "specific compositions" and having an average particle size of less than 200 nm. As stated in section (9) "Ground of Rejection", the "specific compositions" are taught by DeVoe at col. 12, lines 54-65 and col. 14, lines 43-44. Ceramic covers boehmites, yttrium oxides and clays; glass covers alumina silicates, and silica as disclosed by DeVoe at col. 14, lines 43-44 is synonymous to silicon oxides. Particle size of less than 200 nm is taught by Ranney at col. 15, lines 49-57 and col. 19, lines 55-57.

7. With regard to claims 22-44, Applicants argued that neither DeVoe nor Ranney disclose or suggest an article comprising such immobilized particles. Articles comprising the nanoparticles are suggested by Ranney at col. 15, lines 7-48.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Hoa Thi Le

Conferees:

Carol Chaney

Terrel Morris